An investigation into prosodic patterns in the Ness dialect of Scottish Gaelic

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1 Introduction

It has been known for some time that there are minimal pairs in Scottish Gaelic (ScG) which exhibit a prosodic contrast. Examples of such pairs are:

1.	*anam*	/¹anam/	'soul'	*ainm*	/²anam/	'name'
2.	*fitheach*	/¹fiɔx/	'raven'	*fiach*	/²fiɔx/	'debt'
3.	*adha*	/¹a:/	'liver'	*àth*	/²a:/	'ford'

In some dialects, these pairs are differentiated by their pitch patterns. The left-hand words (*anam*, *fitheach*, *adha*) all share the same pattern. I refer to this group as 'Accent 1'. The right-hand words are realised with a different pattern, and are referred to as 'Accent 2'. Superscript numbers in the transcription indicate whether the word is Accent 1 or 2. These labels are used for reference only, and do not imply a distinction of lexical tone. In the phonemic transcription throughout this dissertation I do not regard vowels in unstressed syllables as schwa, even though they can be phonetically realised as such.

The distinction between these word pairs has been subject to different analyses. Some of these involve differences in syllabification, others differences in length. A more recent analysis argues for a tonal contrast. This dissertation presents data which reveals patterns relating to the prosodic contrast between word pairs such as those above. It provides an original interpretation of the distinction based on these patterns, including an analysis formed within the autosegmental framework.

Throughout this section I provide the reader with the background knowledge necessary for an understanding of the investigation. This includes relevant information regarding ScG phonology, and discussion of the typological and theoretical frameworks. I comment on the limitations of previous research into ScG, and the methodological advantages of typologically comparable studies in other languages. These motivate a set of research goals.

The prosodic contrast emerged after two phonological developments took place in ScG. The orthography often gives a clue as to what happened diachronically. In some Accent 1 words, an intervocalic consonant was lost e.g. *fitheach* /¹fiɔx/ 'raven', and *adha* /¹a:/ 'liver'. However, they are not treated like other words with long vowels or diphthongs as a result of this development. In Accent 2 words such as *ainm* /²anam/ 'name', and *carbad* /²karabad(ˊ)/ 'carriage', a vowel has been

inserted to break up the final consonant cluster. This vowel is traditionally referred to as a 'svarabhakti' vowel in Celtic linguistics, a term which derives from Sanskrit. It is also described as 'epenthetic'; a term which is more widely used in phonology and refers to a sound which has been inserted into a word. The insertion of the svarabhakti vowel created a new syllable. However, this was not followed by a corresponding adjustment in the placement of stress, which is usually assigned to the first syllable of a word. These developments have resulted in minimal pairs such as those given above, and a synchronic situation in which the distribution of the two accentual patterns is as follows:

Accent 1 is found:

- in words where the first two syllables contain short vowels

  e.g. *anam* /ˈanam/ 'soul'

- in words in which an intervocalic consonant was lost after an initial syllable with a short vowel

  e.g. *fitheach* /ˈfiɔx/ 'raven'

- where a syllabic enclitic has been incorporated into a monosyllabic word with a short vowel

  e.g. *tha e* /ˈha:/ 'he is'

Accent 2 is found:

- in words where a svarabhakti vowel has been inserted to break up a consonant cluster

  e.g. *ainm* /²anam/ 'name'

- in words with a long vowel or diphthong

  e.g. *àth* /²a:/ 'ford'

  fiach /²fiɔx/ 'debt'

These definitions apply for the majority of ScG words, which have initial stress. Exceptions include compounds and some loan words. These can be classed as Accent 1 or Accent 2 also, but only from

the first stressed syllable of the word. For example, *an-uiridh* /an¹uri/ 'last year' is an Accent 1 word, but the features distinguishing Accent 1 are identified from the stressed syllable onwards. I therefore transcribe the superscript Accent number before the first stressed syllable.

The accentual distinction is maintained in most ScG dialects. Ternes identifies a northern and a southern dialectal area. He writes that the contrast is one of pitch in dialects spoken in the northern area, roughly comprising Lewis and the northern part of the mainland (Ternes 2006: 138). Presence or absence of glottalisation is the primary distinguishing feature for dialects in the southern area, which comprises 'roughly the Southern Hebrides (from Harris to Barra), Skye, the islands of the Inner Hebrides to the south of Skye (e.g. Tiree) and the southern parts of the mainland, including Argyll and Kintyre' (Ternes 2006: 138). These areas are indicated on the map in section 8.2. Discussion of the prosodic contrast in the southern area is given by Jones (2006), who describes how the distinction is maintained by a glottal stop in southern Argyllshire, and Watson (1996), who discusses how the glottal fricative, i.e. /h/, came to replace a historical intervocalic consonant in some dialects. Some peripheral dialects may no longer distinguish between Accent 1 and 2: Dorian explains that 'the concept of the svarabhakti vowel has no place in a synchronic description of ESG [East Sutherland Gaelic]' (1978: 57). She emphasises that the situation regarding vowel length in this dialect is unclear, but that historically long vowels do have distinctive pitch (Dorian 1978: 59-61).

The accentual distinction in the northern area is of particular interest, as the primary distinguishing feature, the pitch contour, also maintains phrasal and attitudinal contrasts. Descriptions of the accentual patterns of this area have been given for dialects spoken in Lewis (Oftedal 1956: 26-9, Borgstrøm 1940: 53-6, Ladefoged et al. 1998: 142-5) and Applecross (Ternes 2006: 140). They describe the Accent 1 contour as being level or slightly rising before falling steeply. The Accent 2 contour is described as level or rising for the Lewis dialects. Ternes describes the Applecross Accent 2 contour as wavy in shape: falling, slightly rising, then falling again. F0 contours from my own data collected in Ness, Lewis are shown in Figure 1.0. F0 stands for 'fundamental frequency', which correlates with pitch. These contours are similar to the descriptions given for other dialects in Lewis, but the Accent 1 contour is falling throughout the whole word. The difference may be due to a dialectal distinction or a difference in phrasal context.

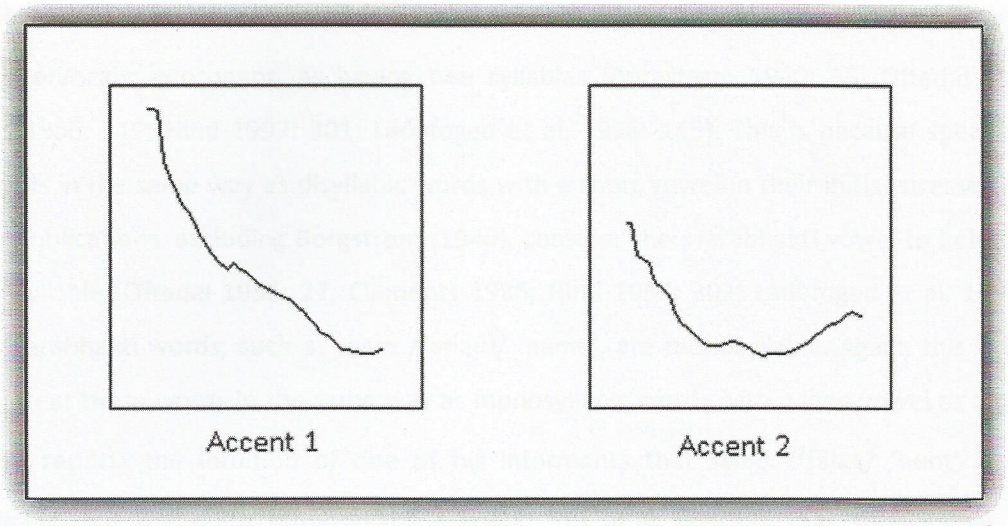

Figure 1.0

F0 contours for *fitheach* /¹fiɔx/ 'raven' and *fiach* /²fiɔx/ uttered by speaker 3. The words were embedded in the statement *tha mi smaoineachadh air fitheach/fiach* 'I am thinking about a raven/debt'. This phrasal context is discussed in section 2.1.

The distinction between Accent 1 and 2 has been analysed in various ways. Borgstrøm (1940: 55) holds that a syllable containing a svarabhakti vowel has distinctive syllabification. In *orm* /²aram/ 'on me', the syllabic boundary is before /r/ (CV syllabification), whereas in *aran* /¹aran/ 'bread' it comes after (VC syllabification). Borgstrøm's analysis is considered by Clements (1986), who is aware it causes problems for the common view that 'no languages have lexically distinctive syllabification' (1986: 318). He concludes that all words in ScG underlyingly have VC syllabification, and the CV syllable is a surface characteristic of words with a svarabhakti vowel. He argues that the svarabhakti vowel is inserted by a synchronic phonological process, and that the disyllabicity of words which lost an intervocalic consonant is maintained by a '"silent consonant", characterized by no features other than nonsyllabicity' (Clements 1986: 333). He claims that this 'silent consonant' can be part of the phonological context causing the insertion of the svarabhakti vowel. For example, *marbhadh* /²mara(C)əɣ/ 'killing', where (C) indicates the 'silent consonant'.

Oftedal (1956: 30) distinguishes between a phonemic and phonetic syllable, though he does not provide detailed descriptions for either. Oftedal's (1956: 27) auditory impression is that an intervocalic /r/ or /l/ always belongs to the following syllable. Such CV syllabification is generally assumed to be universal.

Most publications treat Accent 1 words such as *fitheach* /ˈfiɔx/ 'raven' and *adha* /ˈa:/ 'liver', which lost an intervocalic consonant, as having two syllables (Borgstrøm 1940: 55; Oftedal 1956: 27; Clements 1986: 319; Hind 1997: 301; Ladefoged et al. 1998: 145). This is because speakers treat these words in the same way as disyllabic words with a short vowel in their initial stressed syllable. All these publications, excluding Borgstrøm (1940), consider the svarabhakti vowel to belong to the previous syllable (Oftedal 1956: 27; Clements 1986; Hind 1997: 302; Ladefoged et al. 1998: 145). That is, svarabhakti words, such as *ainm* /ˈanam/ 'name', are monosyllabic. Again, this is because speakers treat these words in the same way as monosyllabic words with a long vowel or diphthong. Borgstrøm reports the intuition of one of his informants that *sealg* /ˈʃalag/ 'hunt' is '"nearly monosyllabic, but not quite monosyllabic"' (1938: 78). It is possible that such native speaker intuitions are influenced by the orthographic spelling, which rarely represents the svarabhakti vowel and tends to indicate where a historical intervocalic consonant has been lost. However, Oftedal notes 'it is significant that in songs, even local *òrain* [ScG 'songs'] that have never been written down, a svarabhakti group is sung on one note' (1956: 29). William Gillies (personal communication) points out that in traditional Gaelic poetry, svarabhakti words tend to rhyme with other svarabhakti words and occasionally with other Accent 2 words.

Definitions of the syllable in linguistic theoretical models cannot allow words such as *ainm* /ˈanam/ 'name' to be monosyllabic. Goldsmith (1990: 108) writes that '[t]raditional work on the internal structure of the syllable has arrived at the hardly surprising conclusion that the syllable is a phonological constituent composed of zero or more consonants, followed by a vowel, and ending with a shorter string of zero or more consonants'. Further to this description, he suggests that the syllable may be defined according to a *'Sonority Principle'* (Goldsmith 1990: 110). He cites an explanation from Bloch and Trager, which includes the following statement: '[t]he sounds which constitute the peaks of sonority are called SYLLABIC; and an utterance has as many SYLLABLES as it contains syllabic sounds' (Bloch and Trager 1942: 22). Vowels are more sonorous than nasals, according to the sonority hierarchy (Goldsmith 1990: 111). *Ainm* /ˈanam/ therefore contains two peaks in sonority, and so has two syllables. The citation provided by Goldsmith (1990: 110) of Bloch and Trager discusses the syllable further:

> When two vowels are uttered without hiatus (a break or pause between them), each may be the peak of a separate syllable or the two vowels may belong to the same syllable. The decisive factor is usually the distribution of the stress... whether each vowel is pronounced with a separate impulse of stress or whether a single impulse extends over both. (Bloch and Trager 1942: 22)

This definition would allow Accent 1 words such as *fitheach* /ˈfiɔx/ 'raven' and *adha* /ˈa:/ 'liver' to be regarded as disyllabic, if they can be shown to have two separate impulses of stress. Acoustic analysis of these words, taking into consideration the patterns in amplitude and vowel quality, would reveal whether this is the case.

In a recent publication, Ternes (2006: 129-45) analyses the distinction between Accent 1 and 2 as involving two tonal specifications, which he names Tone 1 and Tone 2. This is an attractive approach, as there is no need to provide a definition of the syllable which contradicts its typological definition, nor to set up a three-way length distinction, as in Ternes' previous analysis (2006: 81). He explains that the length difference may be phonetic: '[t]one may be associated with duration of the syllable nucleus. A complex tone contour (e.g. falling-rising) will take more time than a simpler tone contour (e.g. falling)' (2006: 132). He does not make reference to the behaviour of other potentially distinctive features, such as vowel quality and amplitude. These, combined with length, are the phonetic parameters of stress. It cannot be proven that ScG has a tonal contrast until the possibility of distinctive stress has been ruled out.

Ternes' (2006) hypothesis that ScG has a tonal contrast leads him to classify ScG as a pitch-accent language. He states that pitch-accent languages have one contrastive tone per word, and may also have contrastive stress (2006: 130). It is argued by Hyman (2006) that there is no prototype of a pitch-accent language, so it is not possible to give it an explicit definition. Remijsen (2001: 40-41) explains that lexical pitch-accent is structurally the same as lexical stress, but is indicated by F0 rather than other parameters (his classification is based on Trubetzkoy (1939) and Beckman (1986)). He draws attention to hybrid systems, which feature either lexical tone and lexical stress, or lexical pitch-accent and lexical stress. The different systems within these hybrids can interact in different ways and have varying degrees of interdependence. According to this definition, the tone contrast proposed by Ternes would mean that ScG is a hybrid system with both lexical tone and lexical stress. That is, both tone and stress can signal contrasts between words. Tone is the feature which distinguishes between Accent 1 and Accent 2 words which make up a minimal pair, such as *fitheach* /ˈfiɔx/ 'raven' and *fiach* /²fiɔx/ 'debt'. Although stress in ScG is almost always word-initial, it is assigned to non-initial syllables in some loan words, e.g. *compiùtar* /kɔmˈpjutər/ 'computer', and compounds, e.g. *an-diugh* /aˈn´u/ 'today'. As stress does not consistently associate with a particular syllable, it is a contrastive feature in ScG.

In a review of treatment of the syllable in ScG dialect studies, Bosch (1998) finds that 'much descriptive work on Scottish Gaelic dialects makes mention of syllables and syllable structure, but a clear definition is rarely forthcoming' (1998: 18). This is the case for the analyses discussed above, which clearly do not share a common definition of the syllable. This fact is likely to go quite a way to accounting for the different conclusions reached. For an account of Accent 1 and 2 to be comparable cross-linguistically, it must apply a universally accepted definition of the syllable.

The disagreement between the views outlined above cannot be resolved without data which goes beyond the scope of that which has been collected so far. In my view, there are two main limitations of previous descriptions of the accentual distinctions. Firstly, no description discusses the interaction of F0 with other prosodic features, such as length, vowel quality and amplitude. Furthermore, there is no description which aligns the F0 contour with a segmented utterance. Consideration of the interaction of prosodic and segmental features is necessary for a full understanding of the accentual distinction. Such consideration would reveal the distinguishing features of the distinction. It would show whether the contrast is purely tonal, or if it is a function of the prosodic structure.

Secondly, previous descriptions of the two intonation patterns do not consider their realisation in various phrasal contexts. Studies into languages with a word-prosodic distinction have shown that an understanding of this cannot be achieved without investigation of its interaction with phrase-level prosodic features. An example is Gussenhoven and van der Vliet's (1999) investigation into Venlo Dutch. This dialect has two contrastive lexical tones, which take on different F0 patterns depending on the phrasal context. The article identifies patterns for twelve phrasal contexts in which the word tones are contrastive. The tone patterns depend on the phrasal intonation contour, whether the word is in final position, and whether the word is prominent. Another example is Remijsen and van Heuven (2005), which presents an account of the word-prosodic system in the Curaçao dialect of Papiamentu. This dialect has both lexically distinctive stress and an independent tone contrast. As with ScG, previous studies had formulated analyses without much evidence as to the realisation of the contrasts, nor their interaction with phrase-level prosodic features. After carrying out a detailed acoustic analysis of three-way minimal contrasts in various phrasal contexts, Remijsen and van Heuven conclude that the tonal specifications associate with words rather than with syllables, as was previously thought. Realisation of word-prosodic contrasts in Scandinavian dialects are also dependent on the phrasal context. Riad (2006) discusses the primary typological parameters involved in the distinction. In most dialects, the realisation of each lexical tone is dependent on whether the word is prominent, and whether it is in final position.

These studies present their analyses within the autosegmental framework. Introductions to this are given by Goldsmith (1990) and Ladd (2008). Autosegmental representation consists of separate tiers of phonological segments. The tonal tier is separate from other tiers, and consists of level tones, or pitch targets, which may be high (H) or low (L) and are realised as one continuous contour. Autosegmental analyses refer to the association of the tonal and non-tonal tier. This can be demonstrated with an example from Venlo Dutch shown in Figure 1.1. The example includes boundary tones (L_i) which signal the beginning and end of the phrase. The prominence tone (H*) indicates narrow focus on 'understand'. The example shows that the association of tones with the segmental tier does not function on a one-to-one basis: there is not one tone assigned per word or syllable.

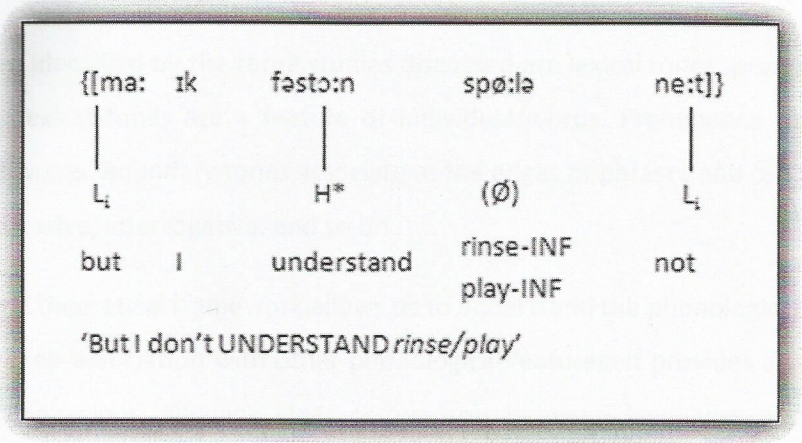

Figure 1.1

Example to demonstrate the association of the tonal and segmental tiers (Gussenhoven and van der Vliet 1999: 108).

The examples in Figure 1.2 demonstrate that several tones can associate with one syllable, and one tone can spread over several syllables. The lexical tone 'H' is a feature of the word 'play'. 'H_u' is another boundary tone, which marks a question.

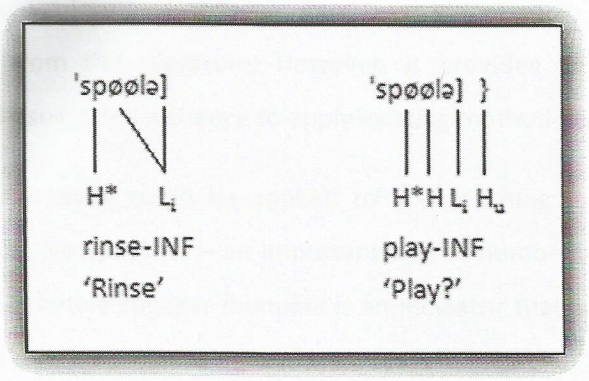

Figure 1.2

Examples to demonstrate that the association of the tonal and segmental tiers is not one-to-one (Gussenhoven and van der Vliet 1999: 111).

The types of tones identified by the three studies discussed are lexical tones, prominence tones and boundary tones. Lexical tones are a feature of individual words. Prominence tones associate to narrowly focused words. Boundary tones associate at the edges of phrases and can indicate whether the phrase is declarative, interrogative, and so on.

The autosegmental theoretical framework allows us to understand the phonological processes which affect tones and their association with other phonological features. It provides a systematic way of identifying tonal behaviour, allowing clear comparison between languages and leading to the identification of typologically common patterns. Using this framework, it is possible to distinguish between underlying lexical tones and phrasal post-lexical tones, and to investigate the interaction between these.

An acoustic investigation into the behaviour of Accent 1 and 2 in ScG, analysed within the autosegmental framework, would lead to an understanding of ScG prosodic behaviour as a phonological phenomenon. An accurate description, followed by analysis of the patterns for a particular dialect would be comparable with future descriptions for other dialects, and could encourage further consideration of prosodic behaviour as a dialectal variable. This would develop our understanding of dialectal boundaries and provide evidence regarding the diachronic development of ScG.

Such an analysis would be comparable with those of other languages, allowing ScG to contribute to our understanding of prosodic systems in general. Research into minority languages is particularly important to our understanding of language structure universals. The lack of prior research in this

area for ScG, as with many minority languages, may seem daunting to the investigator as little guidance can be drawn from the literature. However, it provides an opportunity for a new perspective on theoretical issues, and a chance to apply existing methodologies.

An understanding of ScG prosody could be applied to ScG teaching methods. This would help learners sound more like native speakers – an important skill as numbers of these continue to fall. Furthermore, this decline in native speaker numbers is an indicator that such an investigation must begin now while there are still Gaelic-speaking communities left.

The descriptions presented in this dissertation, are based on data collected in Ness - the area covering the northern tip of Lewis. Its Gaelic-speaking community is one of the strongest remaining. This makes it an attractive dialect to investigate, as linguistic variation between speakers is likely to be minimal. Lewis dialects are recognised for their extreme pitch fluctuations. They are therefore ideal for an investigation into pitch, as patterns are likely to be clear.

In this section, I have drawn attention to the shortcomings of previous accounts of the distinction between Accent 1 and 2, and identified advantages of the methodology and analysis of investigations carried out for prosodic patterns of other languages. These considerations motivate a set of aims for this dissertation. The primary goals are to provide a description of Accent 1 and 2 in various phrasal contexts, based on acoustically analysed data for Ness Gaelic, and to provide an autosegmental analysis of the F0 patterns. A further aim is to advance discussion surrounding ScG syllable structure by considering patterns in vowel length, vowel quality and amplitude (i.e. the phonetic correlates of stress), and their interaction with the F0 contour.

The structure of the remainder of this dissertation is as follows: section 2 introduces the dataset and describes how it was collected and analysed, and comments on speaker variation. Section 3 discusses evidence for syllabification and stress patterns. Section 4 presents descriptions of patterns found in the data. Section 5 provides an autosegmental analysis of the F0 patterns. Section 6 presents the main conclusions reached, and includes suggestions for future investigation. The bibliography is given in section 7. The appendices make up section 8. They include information about the speakers, a map showing relevant locations, and the full dataset.

2 Methodology

Section 2.1 provides an overview of the dataset, which is given in full in section 7.3. Section 2.2 describes the collection and analysis of the data.. Section 2.3 discusses variation between speakers and within the speech of individual speakers.

2.1 Dataset

I investigated pairs of words exhibiting the prosodic contrast in different phrasal contexts. In each context, these target words were inserted into a frame sentence. Where possible, the same frame sentence was used throughout each context to keep segmental influence constant. The set of words chosen included a variety of vowels, so that the accentual contrasts could be observed in different segmental environments. The target words recorded are as follows:

	Accent 1			Accent 2		
(a)	*anam*	/ˈanam/	'soul'	*ainm*	/ˈˈanam/	'name'
(b)	(*carabhan*	/karavan/	'caravan')	*carbad*	/ˈˈkarabad(ʲ)/	'carriage'
(c)	*fitheach*	/ˈfiɔx/	'raven'	*fiach*	/ˈˈfiɔx/	'debt'
(d)	*rudhadh*	/ˈruəɣ/	'blushing'	*ruadh*	/ˈˈruəɣ/	'ginger'
(e)	*tighinn*	/ˈtʲiːnʲ/	'coming'	*tinn*	/ˈˈtʲəinʲ/	'ill'
(f)	*adha*	/ˈaː/	'liver'	*àth*	/ˈˈaː/	'ford'

In pairs (a) and (b), the second phonetic syllable of the Accent 2 words contains a svarabhakti vowel. The Accent 2 words in pairs (c)-(f) contain a long vowel or diphthong. The corresponding Accent 1 words in pairs (c)-(f) have lost an intervocalic consonant. Pair (a) has the only Accent 1 word which did not lose an intervocalic consonant. *Carabhan* is in brackets as its stress pattern was variable. Although it was included as an Accent 1 word, it is no longer transcribed as such as it can only be classed as Accent 1 for one of its two alternative stress patterns (see sections 3.2 and 4.2.7). In the transcriptions of the words in pair (e), /ʲ/ indicates palatalisation. It is included in brackets for *carbad*, as the pronunciation was variable. *Carbad* is the only Accent 2 word to contain a final

unstressed syllable. In section 3 it is shown that this syllable reveals F0 patterns which do not feature in the other Accent 2 words.

The target words were elicited in the following contexts:

(a) 'Final' The target word is in utterance-final position, and is the only new information.

(b) 'Medial' The target word is in utterance-medial position, and is the only new information.

(c) 'In focus' The target word is in utterance-medial position, and is narrowly focused.

(d) 'Out of focus' The target word is in utterance-medial position. The word in final position is narrowly focused.

(e) 'Question' The target word is in utterance-final position. The sentence constitutes a yes-no question.

To achieve (a)-(d), each utterance was given as an answer to a preceding question. In (a) and (b), the target word is the only new information in the utterance, and is focused by default. The remainder of the utterance is taken from the preceding question. Here are examples of question and answer pairs for (a) and (b):

(a) 'Final' *Cò air a tha thu smaoineachadh*?

'What are you thinking about?'

Tha mi smaoineachadh air fitheach.

'I'm thinking about a raven.'

(b) 'Medial' *Cò air a tha thu smaoineachadh*?

'What are you thinking about?'

Tha mi smaoineachadh air fitheach a-rithist.

'I'm thinking about a raven again.'

In (c), the target word is narrowly focused. This creates a contrast with the preceding question. For example:

(c) 'In focus' *Bheil uiseag aig Màiri?*
'Does Mary have a lark?'

Chan eil, tha fitheach aig Màiri.

'No, Mairi has a raven.'

In (d), a word other than the target word is narrowly focused. The target word therefore is not focused. For example:

(d) 'Out of focus' *Bheil am fitheach aigesan?*
'Does the raven belong to him?'

Chan eil, tha am fitheach aig Màiri.
'No, the raven belongs to Mairi.'

In (e), it is the speaker who goes first. The utterance is a yes/no question. For example:

(e) 'Question' *Bheil thu smaoineachadh air fitheach?*
'Are you thinking about a raven?'

Chan eil, chan eil mi smaoineachadh air fitheach.
'No, I'm not thinking about a raven.'

The phrasal contexts chosen are modelled on those used by Remijsen and van Heuven (2005) and Gussenhoven and van der Vliet (1999), in which a variety of tonal patterns emerged. They allow the target words to be elicited with different degrees of focus, and in different positions in the utterance. Within each context, it was possible to use the same frame sentence for all nouns. Alternative sentences were used for verbs and adjectives, which were as similar as possible to those used for nouns. In 'in focus' context, the assistant's question was different for each target word, so that the contrast introduced by the target word was meaningful in each exchange. This encouraged maximum focus. *Fitheach* and *fiach* were included twice in contexts (a), (b) and (e): once as an indefinite noun, and once with the dative definite article. In the dative case, the definite article *an* /ən/ causes deletion of the initial /f/. The F0 contour is therefore uninterrupted and the tonal pattern unobscured. These words were included in their indefinite form to allow fair comparison

with contexts (c) and (d). *Ruadh* was included in two different sentences for contexts (a)-(d) as I was unsure which sentence the speakers would feel more comfortable with. The sentences were segmentally similar, but had different meanings. There turned out to be no difference in the prosodic treatment of the two sentences, and the speakers were comfortable producing both in each context.

2.2 Data collection and analysis

The sentences were uttered as part of an interaction with a native-speaker assistant to encourage natural speech. They were presented on separate slips of paper to create a pause between each interaction and discourage listing effects. The sentences were organised into two groups: 'Group A' and 'Group B'. The groups kept the pairs of target words separate, though each contained a mixture of Accent 1 and 2 words to discourage effects due to repetition of a particular accentual pattern. For each group, the set of sentences for each context was kept together to reduce reading effects. All sentences were recorded twice, with a short break between repetitions. They were presented in a different order for each repetition to balance out ordering effects. Four dummy sentences were included before the dataset itself to familiarise the speaker with the task and allow recording levels to be set. Whilst recording, I avoided interaction with the speaker and assistant where possible in order to minimise effects due to a non-native speaker being present.

Recordings were made of eight native speakers, all of whom were friends or family of the assistant and had been brought up in Ness. They were chosen on account of their speech being characteristic of the Ness dialect. All speakers were fluent in English, but used Gaelic in most social domains. Some were aware that they used a more formal style of Gaelic at work. A profile of information for each speaker is given in section 8.1.

Recordings were made using a close-talking microphone mounted on a headset and a solid-state recorder. The dataset was analysed visually using Praat (Boersma and Weenink 2008). *Anam* and *ainm* were segmented, along with adjacent unstressed morphemes. This made it possible to clearly see the alignment of prosodic features with the segmental content. This set was chosen because the sounds involved could be accurately segmented. Also, the voicing throughout means there is no interruption in the F0 trace.

While the main focus of data analysis was on the F0 contour, I also looked for patterns in length, vowel reduction and amplitude. These tend to indicate stress patterns. A well-motivated analysis of

the tonal contours cannot be developed without an understanding of the role of stress in distinguishing Accent 1 and 2.

2.3 Variation in the data

In contexts (a)-(d), the intonation contour most frequently produced started at a low pitch, rose to the middle of the utterance and fell towards the end. Most speakers produced a different contour for 'question' context. This contour usually started at mid or high pitch, and rose or was sustained to the middle of the utterance then fell towards the end. Alternative contours were occasionally introduced in all contexts. It seemed that some speakers used these alternatives to avoid repetition of the same intonation for each utterance. Usually this involved beginning the utterance at a high pitch rather than a low pitch. Sometimes, the speakers employed alternative intonation to add attitudinal information to the utterance. Some alternative intonation contours affected the tonal patterns of the target words, particularly those of Accent 1 words. For this reason, they were not considered in my interpretation of the data.

Speaker 8 rarely produced patterns shared by the other speakers. His own patterns were marked and consistent. In all contexts, the shape of the utterance contour depended on the position of the word with most focus. The contour rose towards a peak which associated with this word, and then fell towards the end of the utterance. This pattern may indicate a dialectal distinction within Ness itself: speaker 8 described his dialect as particular to Tàbost, one of several villages in Ness. Dialectal distinctions are likely to have been more marked at the time of his upbringing than they are now, as speakers would have been less mobile. It is possible that his patterns reflect an older dialectal distinction. Speaker 5 produced the same intonation contours as speaker 8 about half the time. The rest of the time she produced the same patterns as the other speakers. Speakers 5 and 8 are married, so they may have influenced each others' speech habits over the years. They had lived away from Ness for most of their lives, in which time they may have picked up features of other dialects. Speaker 8's data has been largely excluded from my analysis. However, it is considered in discussion of an alternative Accent 1 contour (see later in this section and section 3.3). Speaker 5's data has been excluded where it does not match the majority pattern.

Speaker 7's speech was hesitant and is likely to have been influenced by reading. She would usually use English with the assistant, and they often switched to English in spontaneous speech during the recording. Her intonation did not fluctuate as much as the other speakers, and she did not produce consistent patterns. As she was much younger than the other speakers, this may reflect a tendency

in ScG towards the wearing down of dialectal distinctions, and lack of certainty regarding pronunciation. It may also be due to increasing use of English amongst younger generations. For these reasons, speaker 7's data is not considered in my analysis.

Accent 2 was realised with little variation between speakers 1-6. The Accent 1 F0 contours were less consistent than those of Accent 2. An alternative Accent 1 contour was identified which could be applied to *fitheach* in 'in focus' context. This contour was occasionally applied to other Accent 1 words which have lost an intervocalic consonant, but not frequently enough for any patterns to emerge. Occasionally, an alternative contour was produced in 'final' and 'question' contexts. Again, this was not frequent enough to identify any patterns, though it seemed to only appear when the target word received a degree of focus. Speakers 7 and 8 always chose the alternative F0 contour for *fitheach* in 'in focus' context, and were most likely to apply it to words other than *fitheach* and in other contexts. This is likely due to the reasons already suggested for their deviation from the intonation patterns used by the other speakers. Speakers 2, 5 and 6 also produced the alternative contour for *fitheach* in 'in focus' context, but were less likely to apply it to other words and other contexts. Speakers 2 and 6 had lived in other parts of Lewis for considerable periods of their lives. Likely influences have already been suggested for speaker 5. Speakers 1,3 and 4 never produced the alternative Accent 1 contour. Speakers 1 and 4 were the only speakers who have lived in Ness their whole lives. It is possible that the alternative contour is a feature which has spread from other dialects, as it is less established in the dialect than the normal Accent 1 contour, and is used by the speakers who have been in contact with other dialects most.

The word *carabhan* /karavan/ 'caravan' was included in the dataset as an Accent 1 word. However, it received variable treatment between speakers, and within the speech of individual speakers. It is likely a borrowing from English. It originally was pronounced with final stress. It may have been finally-stressed in English when it was borrowed, though synchronically this stress pattern can be reanalysed: a speaker of another Lewis dialect claimed she considers finally-stressed *carabhan* to be a compound combining *cara-* and *bhan* 'van'. It is not a proper compound as *cara-* has no independent meaning. Primary stress is assigned to the second member of ScG compounds. The second member here is *bhan*, which is a monosyllabic word with a short vowel. Such words are neither Accent 1 nor Accent 2. As Accent 1 only applies from the first stressed syllable of a word, finally-stressed *carabhan* cannot be classed as Accent 1. Speaker 1 explained that she pronounced *carabhan* with final stress when she was younger but now pronounces it with initial stress. She believed the change in pronunciation is due to English influence. This is probably true, but it may partly be due to pressure in ScG towards initial stress. This pressure has resulted in initial stress on

some ScG compounds, e.g. *codhunadh* /ˈkɔɣunəɣ/ 'conclusion', which derives from *co-dhùnadh* /kəˈɣù:nəɣ/. This example was suggested by William Gillies (personal communication). Speaker 3 consistently treated *carabhan* as a compound. Speakers 1 and 2 consistently pronounced it with initial stress. The other speakers switched between the two patterns, though pronounced it with initial stress most frequently. The assistant (speaker 3's son) consistently pronounced *carabhan* with final stress, which may have influenced the other speakers. This can explain why the speakers who varied their pronunciation tended to choose final stress for 'out of focus' context, as this is the only context in which the assistant produced the target word before the speaker.

Speaker 6 consistently pronounced *rudhadh* /ˈruəɣ/ 'blushing' differently to the other speakers. She pronounced it /²ruə(ɣ)əɣ/. She treats it as an Accent 2 word comparable to *carbad* /²karabad(ˊ)/ 'carriage' as they both end with an unstressed syllable. The intervocalic /ɣ/ was often deleted, and otherwise very weak. I use the alternative spelling *ruadhadh* when referring to this speaker's treatment of it.

3 Stress patterns and syllabification of the target words

In this section I consider the syllabification and stress patterns of the target words based on patterns in length, vowel quality and amplitude in the data.

Figures 3.1 and 3.2 show average lengths of the first and second vowel of Accent 1 *anam* /ˈanam/ 'soul' and Accent 2 *ainm* /ˈˈanam/ 'name'. The first vowel of *anam* is longer than the second in all contexts. For *ainm*, the second vowel is consistently longer than the first. As neither of these vowels are long enough to be considered phonemically long, this length must indicate primary stress. The second vowel of *anam* is shorter in all contexts than the first vowel of *ainm*. I interpret this as showing that the second vowel of *anam* is unstressed, but the first vowel of *ainm* receives secondary stress.

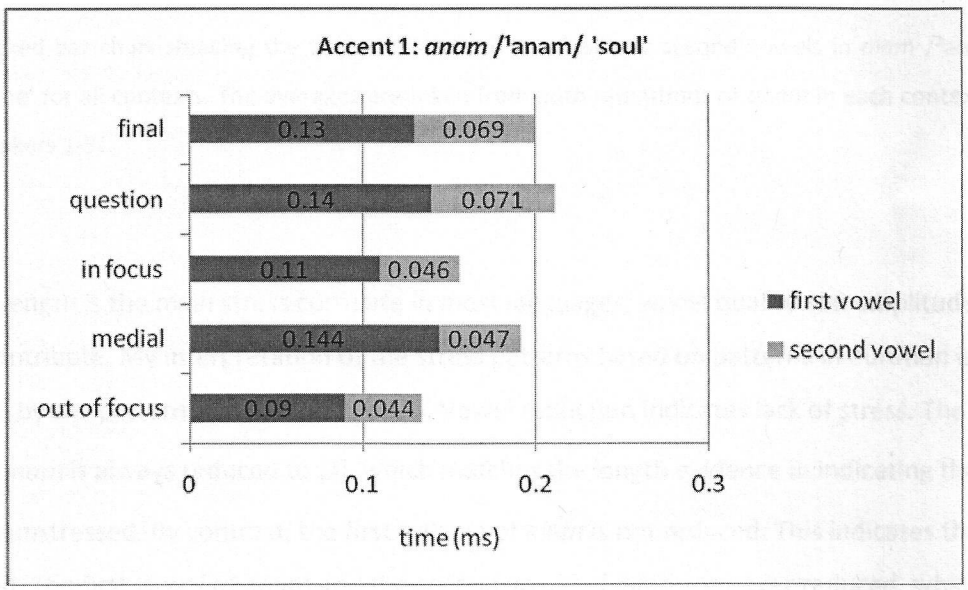

Figure 3.0

Stacked bar chart showing the average length of the first and second vowels in *anam* /ˈanam/ 'soul' for all contexts. The averages are taken from both repetitions of *anam* in each context by speakers 1-3.

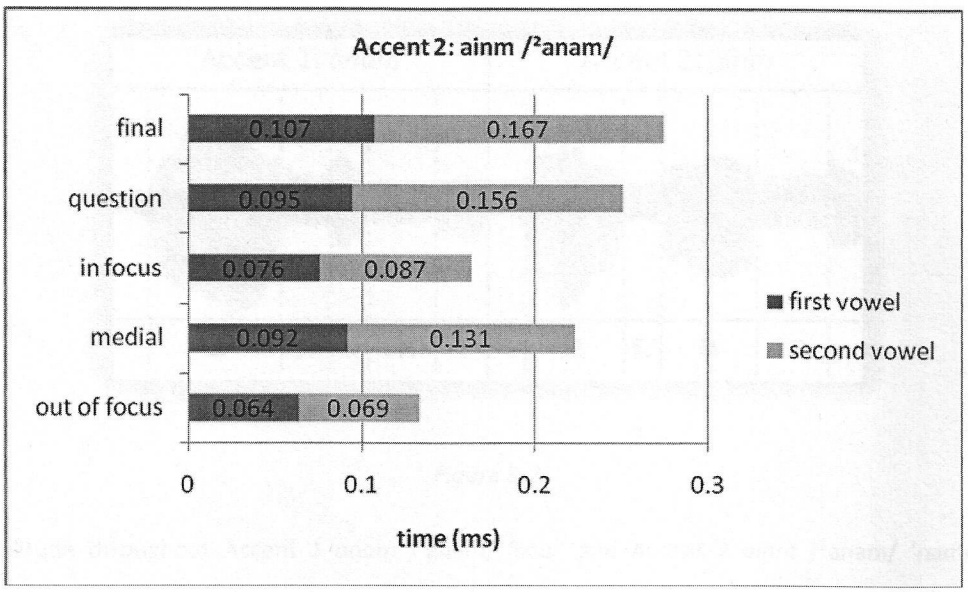

Figure 3.1

Stacked bar chart showing the average length of the first and second vowels in *ainm* /²anam/ 'name' for all contexts. The averages are taken from both repetitions of *anam* in each context by speakers 1-3.

Although length is the main stress correlate in most languages, vowel quality and amplitude also tend to contribute. My interpretation of the stress patterns based on patterns in duration is supported by the patterns in vowel reduction. Vowel reduction indicates lack of stress. The second vowel of *anam* is always reduced to [ə], which matches the length evidence in indicating that the syllable is unstressed. By contrast, the first syllable of *ainm* is not reduced. This indicates that it is not unstressed. The first vowel of *anam* and the second vowel of *ainm* are never reduced, which shows that they are stressed.

This interpretation of the stress patterns is further supported by patterns in amplitude. As is shown in Figure 3.2, the first vowel of *anam* has much greater amplitude than the second, which is a further indication that the first vowel is stressed, the second unstressed. The first and second vowels of *ainm* have similar amplitude. This is further evidence to show that both vowels are stressed. The examples shown in Figure 3.2 are fairly consistent for all speakers in all contexts.

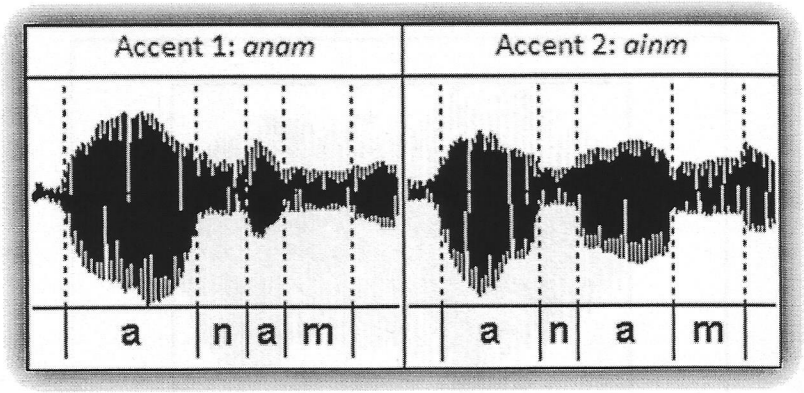

Figure 3.2

Amplitude throughout Accent 1 *anam* /¹anam/ 'soul' and Accent 2 *ainm* /²anam/ 'name' in 'medial' context, spoken by speaker 2.

My treatment of the two vowels of *ainm* as receiving different degrees of stress not only accounts for the length difference between them – it also does not require the word to be regarded as monosyllabic, as with most previous accounts. As was explained in section 1, this means there is no contradiction with the traditional definition of the syllable nor its definition according to the Sonority Principle, neither of which permit *ainm* to be regarded as a monosyllable. In section 1, a question mark was left over the number of syllables in Accent 1 words which lost an intervocalic consonant, such as *fitheach* /¹fiɔx/ 'raven' and *adha* /¹a:/ 'liver'. I stated that they should be regarded as disyllabic if 'each vowel is pronounced with a separate impulse of stress' (Bloch and Trager 1942: 22). Such impulses of stress may be judged by changes in amplitude and vowel quality. These are best considered with the words *adha* /¹a:/ and *tighinn* /¹t´i:n´/, which have the same phonological vowel throughout. This makes it easy to observe vowel reduction due to lack of stress, and means the amplitude pattern of the word is not affected by changes in vowel quality. Figure 3.3 shows the amplitude and spectrogram for an example of *tighinn* in 'question' context. F1 and F2 are the first and second formants of the harmonic spectrum, and indicate the vowel quality. They are marked by dots running through the spectrogram. F1 starts low and F2 starts high. This indicates a high front vowel (/i/). F2 then rises, indicating that the tongue height rises into a glide (/j/). This causes the amplitude to drop (marked by an arrow), which signals a syllable boundary. F1 and F2 come closer together in the second syllable, showing that the vowel is centralised and the syllable unstressed. In this example, *tighinn* clearly is disyllabic. However, the indicators of its disyllabicity were not consistently clear for all speakers in all contexts.

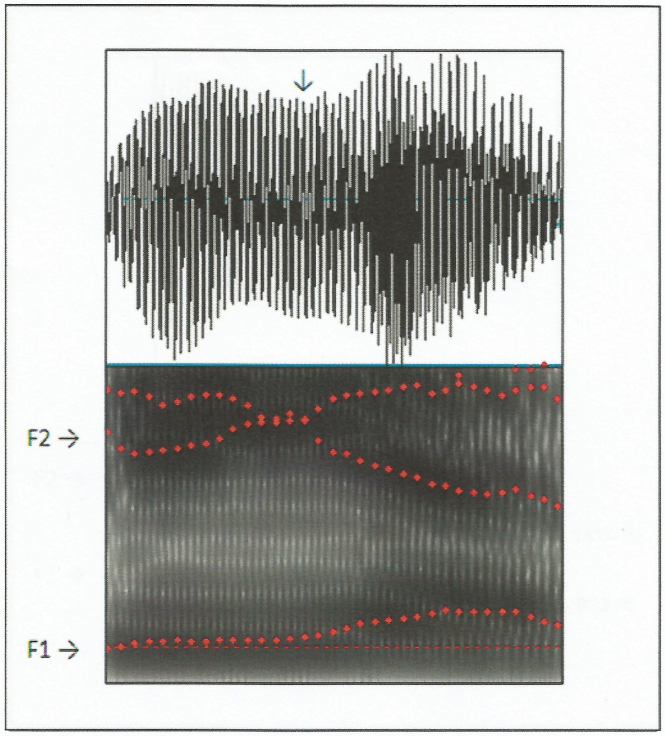

Figure 3.3

Spectrogram and amplitude of the vowel in *tighinn* /ˈtʲiːnʲ/ 'coming', spoken by speaker 2 in 'question' context.

An example of *adha* is shown for 'final' context in Figure 3.4. It can be compared with *àth* /ˌaː/ 'ford' in Figure 3.5. In both words, F1 and F2 start high, then move together slightly to reach their targets for the low front vowel (/a/). In *adha*, they then fall throughout the word, showing that the vowel becomes more centralised. In *àth*, they stay fairly level, showing that the /a/ does not become reduced. This observation is supported by the F1 and F2 frequency values, which are given for both *adha* and *àth* for the last point in the word before the tracking dots become erratic due to breathy voice quality. Those of *adha* are both lower than those of *àth*, which shows the vowel is more central. The amplitude tails off throughout *adha*. As this was not the case in utterance-medial contexts, it can be considered due to its utterance-final position. However, amplitude is sustained throughout *àth*. The sustained amplitude in utterance-final position and vowel quality of *àth* make it clear that it is stressed throughout the whole word. In comparison, the vowel reduction and decrease in amplitude towards the end of *adha* shows that it is not stressed right through: it must have one stressed and one unstressed syllable. An arrow marks a slight dip in amplitude for *adha*, which may indicate the syllable boundary.

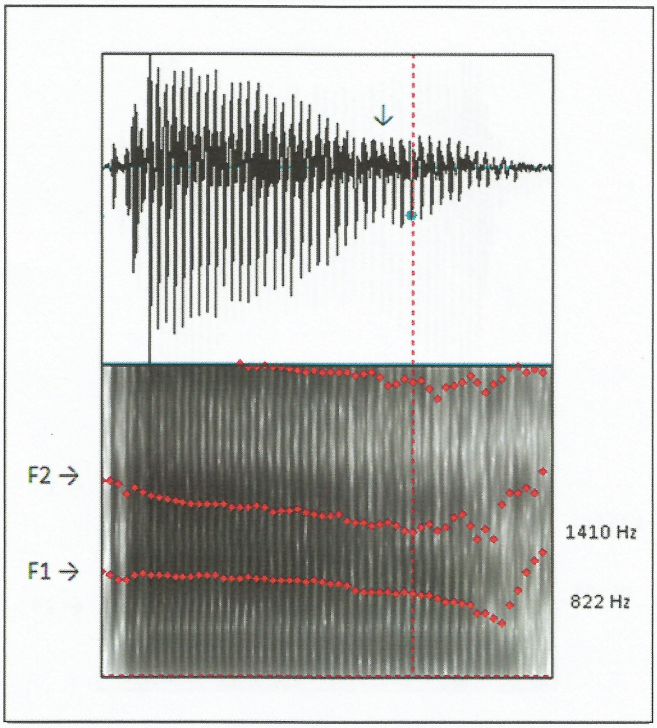

Figure 3.4

Spectrogram and amplitude of *adha* /ˈaː/ 'liver', produced by speaker 1 in 'final' context. Values given in Hertz (Hz) indicate the frequency of F1 and F2 at the vertical red dashed line.

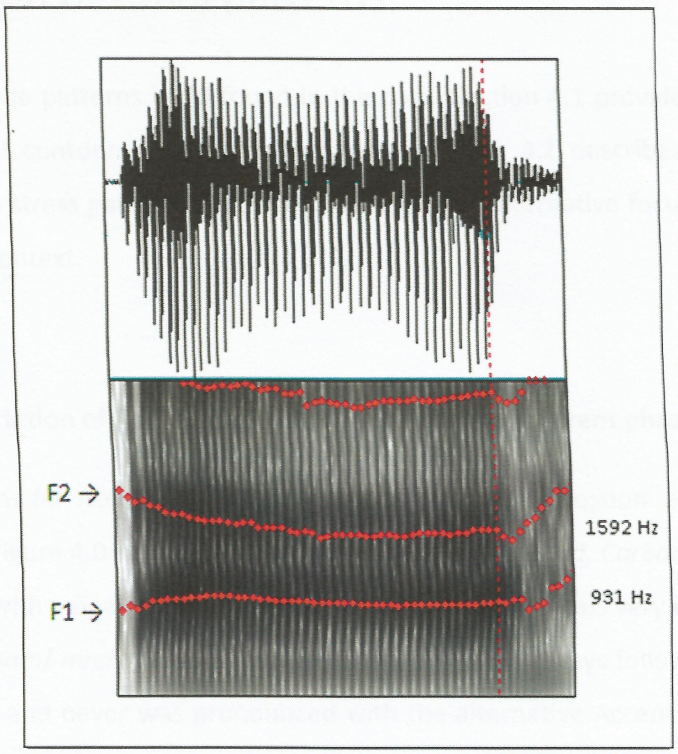

Figure 3.5

Spectrogram and amplitude of *àth* /²a:/ 'ford', produced by speaker 1 in 'final' context. Values given in Hertz (Hz) indicate the frequency of F1 and F2 at the vertical red dashed line.

The vowel quality and amplitude can contribute to indicating that *tighinn* and *adha* are disyllabic, but this is not consistent in utterance-medial contexts. It may be that they can sometimes be treated as monosyllables. However, in section 5.1 an autosegmental analysis is presented which shows that F0 patterns are a function of the stress pattern of the word. Even when vowel quality and amplitude are not enough to indicate a syllable boundary in words such as *tighinn* and *adha*, F0 associates as it would for disyllabic *anam* /¹anam/ 'soul'. F0 can then be considered to contribute to maintaining hiatus between the first two syllables of words which lost an intervocalic consonant.

The discussion above shows that the contrast between Accent 1 and Accent 2 words is one of stress. Both *anam* /¹anam/ and *ainm* /²anam/ are disyllabic, but primary stress is assigned to the first syllable of *anam* and the second of *ainm*. Accent 1 words that lost an intervocalic consonant, such as *adha* /¹a:/, are disyllabic with stress on the first syllable. Accent 2 words with a long vowel, such as *àth* /²a:/, have one syllable which is automatically stressed throughout. As the contrast can be explained by the stress pattern, there is no need to say there is a lexical tone distinction.

4 Description of tonal patterns

In this section I describe patterns in F0 found in the data. Section 4.1 provides descriptions of the Accent 1 and 2 tonal contours in different contexts. Section 4.2 describes the F0 contours of *carabhan* with its two stress patterns. Section 4.3 decribes an alternative focus-marking pattern for *fitheach* in 'in focus' context.

4.1 Description of Accent 1 and 2 tonal contours in different phrasal contexts

Distinctive F0 patterns for Accent 1 and 2 were found in 'final', 'question' and 'in focus' contexts. These are shown in Figure 4.0 with the words *anam*, *ainm* and *carbad*. *Carbad* is included as it is the only Accent 2 word with a final unstressed syllable. This syllable reveals very different F0 patterns in each context. The *anam*/ *ainm* pair was chosen as *anam* almost always followed the set of patterns shown in Figure 4.0, and never was pronounced with the alternative Accent 1 pattern described in section 2.3. A further reason for using these three words is that they could be accurately segmented.

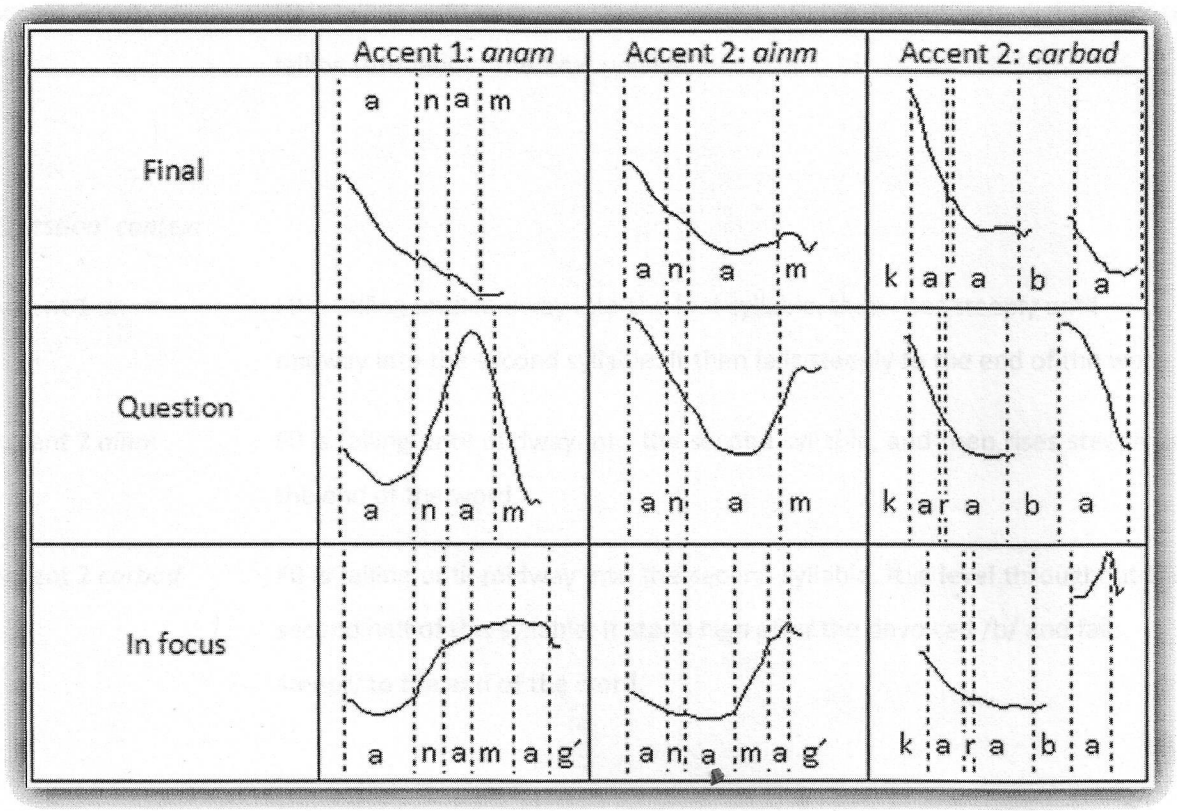

Figure 4.0

F0 contours for *anam* /¹anam/ 'soul', *ainm* /²anam/ 'name' and *carbad* /²karabad(ʹ)/ 'carriage' in 'final', 'question' and 'in focus' contexts, uttered by speaker 3. Vertical lines indicate segmental boundaries. There is no boundary marking the length of /m/ in *anam* and *ainm* for 'final' and 'question' contexts. This is because it is phonetically devoiced, making its length unclear. The unstressed word *aig* /ag´/ following *anam* and *ainm* is included for 'in focus' context as the F0 pattern extends beyond the target word itself. The final segment of *carbad* has been excluded as it has no F0 contour due to the lack of voicing.

Each of the patterns shown in Figure 4.0 is described below:

'Final' context

Accent 1 *anam* — F0 is falling steeply until midway into the first syllable. It continues falling less steeply to the end of the word.

Accent 2 *ainm* — F0 is falling until midway into the second syllable, and then rises slightly to the end of the word.

Accent 2 *carbad* — F0 is falling until midway into the second syllable. It rises very slightly before falling throughout the final syllable.

'Question' context

Accent 1 *anam* — F0 is falling until midway into the first syllable, then rises steeply until midway into the second syllable. It then falls steeply to the end of the word.

Accent 2 *ainm* — F0 is falling until midway into the second syllable, and then rises steeply to the end of the word.

Accent 2 *carbad* — F0 is falling until midway into the second syllable. It is level throughout the second half of this syllable. It starts high after the devoiced /b/ and falls steeply to the end of the word.

It was shown in section 3 that the svarabhakti vowel is consistently longer than the initial vowel of Accent 2 words. By contrast, the vowel of the second syllable of Accent 1 words is always shorter than the initial vowel. In Section 1, I drew attention to Ternes' (2006: 132) argument that the length of the svarabhakti vowel is due to a more complex tone contour. However, in comparing the contours for *anam* and *ainm* in 'question' context, we see that it is the Accent 1 contour that is more complex: falling, rising, then falling, rather than the Accent 2 contour: falling then rising.

'In focus' context

Accent 1 *anam* — F0 is falling until midway into the first syllable. It then rises throughout the final syllable and into the following unstressed word. For other speakers, the rise did not continue beyond the final syllable (not shown in Figure 3.0).

Accent 2 *ainm* — F0 is falling until midway into the second syllable. It rises steeply to the following untressed syllable.

Accent 2 *carbad* — F0 is falling throughout the first syllable. It begins to level out in the second syllable. It is high after the devoiced /b/.

4.2 An alternative focus-marking pattern for Accent 1

As discussed in Section 2.3, it was found that the Accent 1 word *fitheach* frequently was realised with an alternative F0 contour in 'in focus' context. Figure 4.1 shows the two different patterns.

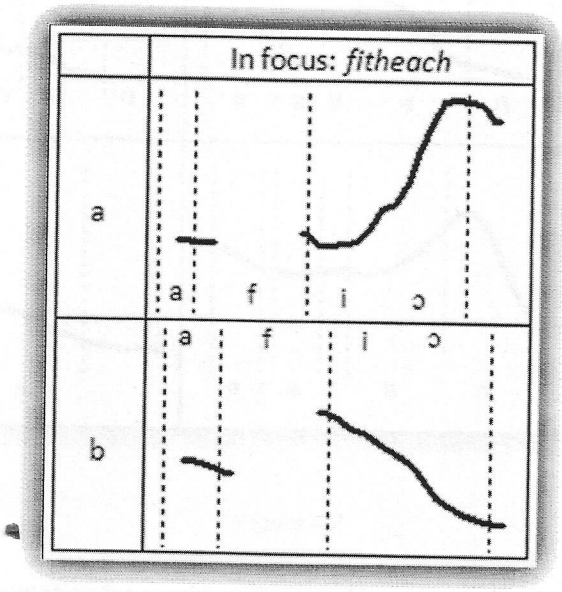

Figure 4.1

(a) and (b) are two alternative Accent 1 contours for *fitheach* in 'in focus' context. The (a) contour shown here was produced by speaker 3. (b) was produced by speaker 6. The portion of the utterance shown is *tha fitheach* /haˈfiɔx/ 'a raven is'.

The (a) contour is the same as that consistently applied to *anam*, as shown in Figure 4.0. For this contour, F0 is low at the beginning of *fitheach* and rises steeply, reaching a peak at the end of the word. For (b), F0 is high at the beginning of *fitheach* and falls towards a word-final low target. Speakers 1, 3 and 4 produced (a), and speakers 2, 5, 6 and 8 produced (b).

4.3 Two stress patterns for *carabhan*

Carabhan /karavan/ 'caravan' can be stressed on the initial syllable or the final syllable. Speaker 1 consistently stressed the initial syllable, and speaker 3 consistently stressed the final syllable. The F0 patterns they produced are shown in Figure 4.2.

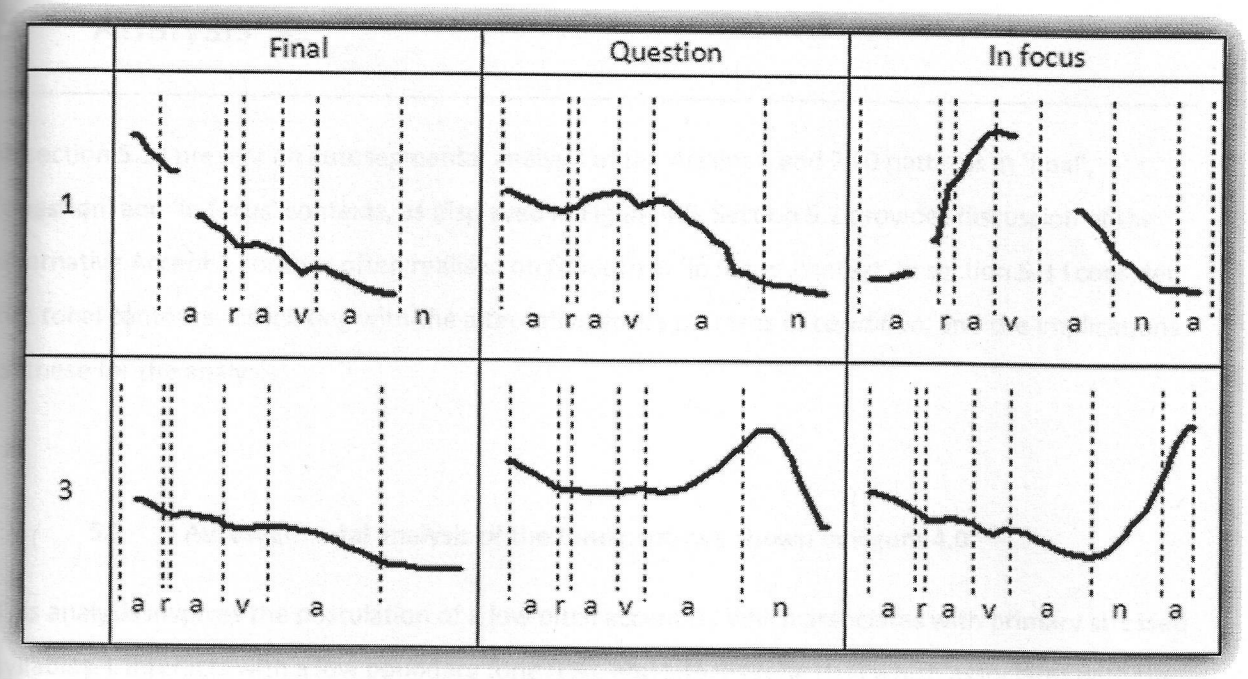

Figure 4.2

F0 contours and segmentation for *carabhan* /karavan/ 'caravan' in 'final', 'question' and 'in focus' contexts, uttered by speakers 1 and 3. Speaker 1 stressed the initial syllable. Speaker 3 stressed the final syllable.

The breaks in speaker 1's F0 contour are due to creaky voice quality. In 'final' context, F0 is falling throughout initial-stressed *carabhan*. The fall is steepest throughout the stressed syllable. F0 is falling throughout the first two syllables of final-stressed *carabhan*, rises a little at the beginning of the final syllable, then falls to the end of the word. For 'question' context, F0 falls, rises, then falls once more for both stress patterns. Where there is initial stress, the rise is realised on the following unstressed syllable and the fall on the final syllable. For final stress, the rise does not begin until midway into the stressed syllable, and the fall is realised on the final /n/. In 'in focus' context, F0 is at its lowest on the stressed syllable, and rises sharply to a high point on the following unstressed syllable. This is followed by a fall in F0 over the following unstressed syllables of initial-stressed *carabhan*.

5 Analysis

In section 5.1 I present an autosegmental analysis of the Accent 1 and 2 F0 patterns in 'final', 'question' and 'in focus' contexts, as displayed in Figure 4.0. Section 5.2 provides discussion of the alternative Accent 1 contour often realised on *fitheach* in 'in focus' context. In section 5.3 I consider the tonal contours associating with the alternative stress patterns of *carabhan*, and the implications of these for the analysis.

5.1 Autosegmental analysis of the tone contours shown in Figure 4.0

This analysis involves the postulation of a low pitch accent (L) which associates with primary stressed syllables. L interacts with a low boundary tone (L%), and a focus tone (H*) which associates with the following syllable. This interaction is influenced by universal preferences and restrictions regarding tonal behaviour. There is a typological tendency towards an avoidance of sequences of identical tones. This preference is accounted for by the Obligatory Contour Principle (OCP), which was formulated by Goldsmith (1979). For ScG, it means that two adjacent identical tones cannot associate with the same syllable, but can associate with separate syllables. Languages also have restrictions on the overcrowding of tones onto one syllable. According to this analysis, ScG cannot allow more than two tones to associate with one syllable. It is worth noting that this analysis applies equally whether the svarabhakti vowel is regarded as part of the first or second syllable.

In focus

The low pitch accent (L) associates with the primary stressed syllable. Focus is marked by a high tone (H*) which associates with the following unstressed syllable. This unstressed syllable does not necessarily belong to the target word. The 'in focus' tonal contours of Figure 4.0 are reproduced in Figure 5.0 with their tone specifications.

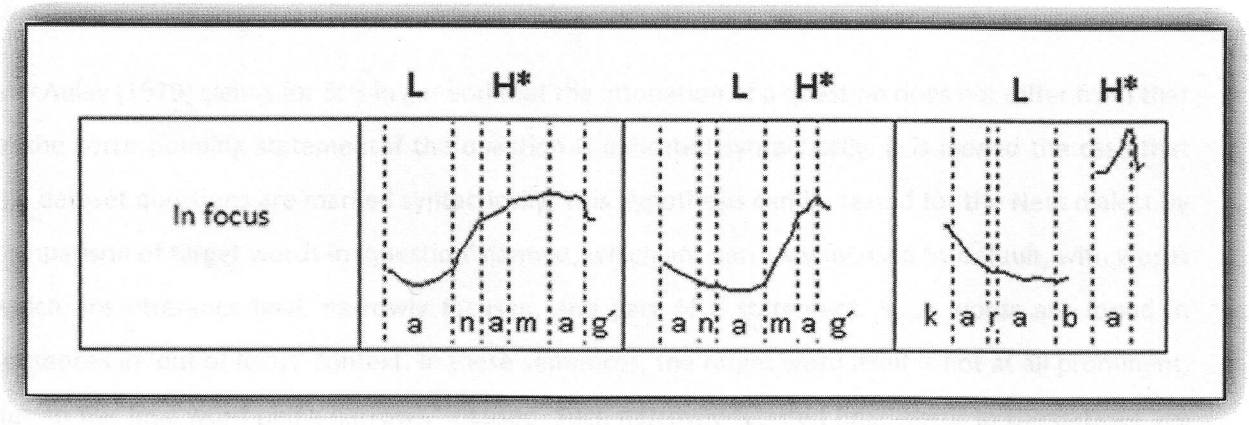

Figure 5.0

'In focus' F0 contours as shown in Figure 4.0 now with tone specifications.

Final

In this context, L interacts with a low boundary tone (L%). Accent 1 *anam* has L on its initial syllable, resulting in a steep fall in F0. F0 continues to fall, but less steeply, towards L% which associates word-finally. L associates with the final syllable of *ainm*. The OCP, which states that identical tones cannot be adjacent, prevents L% from associating with this syllable as it already has L. L% is deleted, resulting in an OCP effect of mid-level pitch. This interpretation was suggested by Bert Remijsen (personal communication). L% is not deleted for *carbad* as L associates with the penultimate syllable. The slight rise in F0 between the final two syllables can also be interpreted as an OCP effect, which keeps L and L% separate. It is unclear why this rise is not realised between the two syllables of *anam*. The 'final' F0 contours from Figure 4.0 are shown with their tones in Figure 5.1.

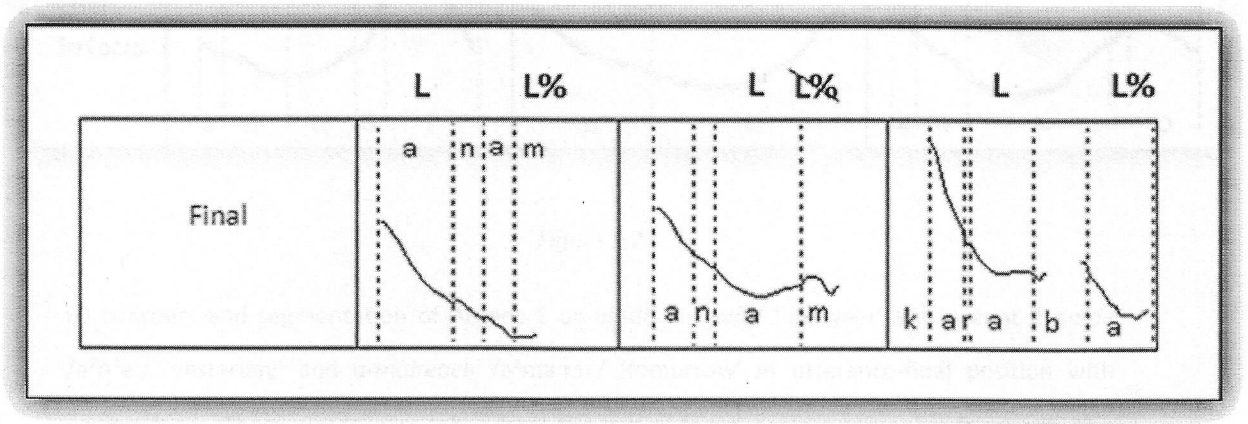

Figure 5.1

'Final' F0 contours as shown in Figure 4.0 now with tone specifications.

Question

MacAulay (1979) claims for ScG in general that the intonation of a question does not differ from that of the corresponding statement if the question is indicated syntactically. It is indeed the case that the dataset questions are marked syntactically. This hypothesis can be tested for the Ness dialect by comparison of target words in 'question' context, which are narrowly focused by default, with words which are utterance-final, narrowly focused, and part of a statement. Such words are found in sentences in 'out of focus' context. In these sentences, the target word itself is not at all prominent, due to the final word being narrowly focused. Such narrowly-focused final words in the dataset are Accent 1 *an-uiridh* /a¹nuði/ 'last year'; and Accent 2 *an-dè* /a²nˊe:/ 'yesterday' and *a-màireach* /a¹ma:rɔx/ 'tomorrow'. Their F0 contours are shown in Figure 5.2. The contours are almost identical to those of 'question' context, shown in Figure 5.3. This evidence leads me to analyse the 'question' contours to be a combination of the low pitch accent tone, the prominence tone and the boundary tone: L H* L%. The following explanation therefore applies to both the statement contours of Figure 5.2 and the 'question' contours of Figure 5.3. The LH* pattern associates as it does for 'in focus' context: L associates with the primary stressed syllable of all words. H* associates with the following unstressed syllable of *anam* and *carbad* and after L on the stressed final syllable of *ainm*. L% shares the final syllable of *anam* and *carbad* with H*.

The overcrowding constraint means L% cannot associate with the final syllable of *ainm*, which already has two tones (LH*).

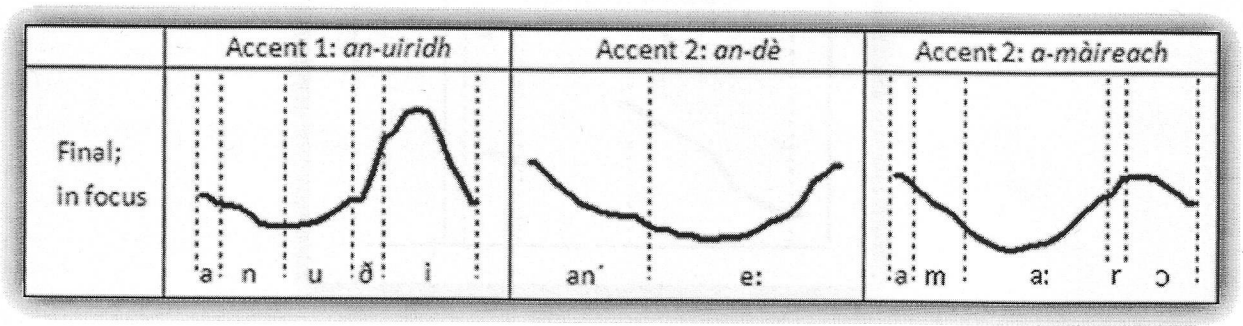

Figure 5.2

F0 contours and segmentation of Accent 1 *an-uiridh* / a¹nuði/ 'last year' and Accent 2 *an-dè* /a²nˊe:/ 'yesterday' and *a-màireach* /a²ma:rɔx/ 'tomorrow' in utterance-final position with narrow focus. These words were taken from the 'out of focus' context sentences for *ruadh, tinn* and *tighinn*: *Chan eil, ach bha i ruadh an-uiridh* 'No, but she was ginger last year'; *Chan eil, bha mi tinn an-dè* 'No, I was ill yesterday'; *Chan eil, tha mi tighinn a-màireach* 'No, I'm coming tomorrow'. The contours shown were produced by speaker 3.

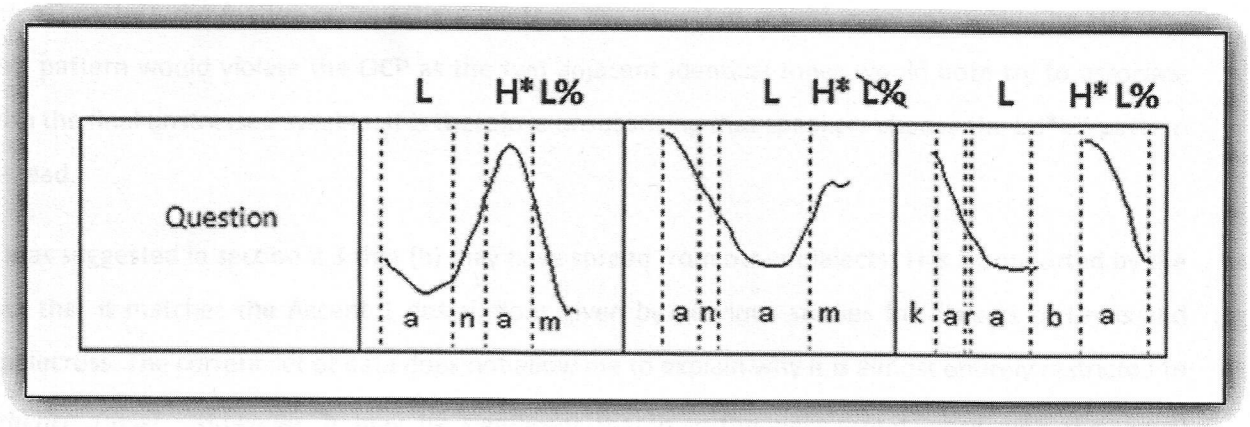

Figure 5.3

'Question' F0 contours as shown in Figure 4.0 now with tone specifications.

5.2 Alternative Accent 1 pattern

The alternative pattern often produced for *fitheach* in 'in focus' context is characterised by a H*L* pattern. H* associates with the prominent initial syllable, and L* associates with the following unstressed syllable. This is shown in Figure 5.4.

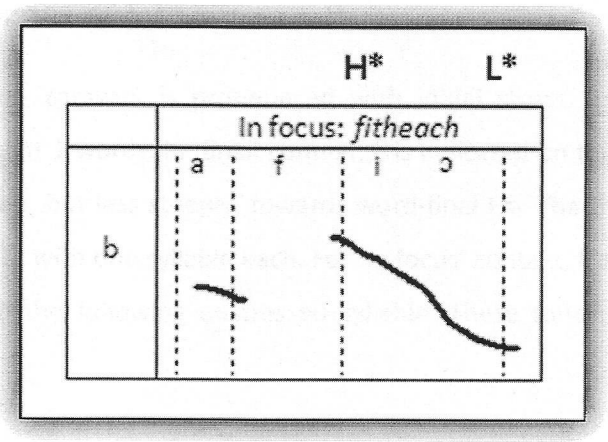

Figure 5.4

F0 contour and segmentation for Accent 1 pattern (b) *fitheach* /ˈfiɔx/ 'raven' in 'in focus' context, now with tone specifications. The portion of the utterance shown is *tha fitheach* /haˈfiɔx/ 'a raven is'.

It may seem surprising that this alternative pattern does not appear in 'question' context, as the 'question' tone pattern was shown to be a combination of the 'in focus' and 'final' tones . However, if

the (b) pattern did feature in 'question' context, the expected resulting pattern would be H*L*L%. This pattern would violate the OCP as the two adjacent identical tones would both try to associate with the final unstressed syllable. It is therefore unsurprising that speakers choose the LH*L% pattern instead.

It was suggested in section 2.3 that (b) may have spread from other dialects. This is supported by the fact that it matches the Accent 1 descriptions given by previous studies for dialects of Lewis and Applecross. The current set of data does not allow me to explain why it is almost entirely restricted to *fitheach* /ˈfiɔx/. However, it may be significant that it is the only target word with the vowel sequence /iɔ/. The /i/ belongs to the stressed syllable of the word. As high vowels have phonetically low amplitude, speakers may particularly rely on F0 to indicate prominence. It may be that the (b) contour can mark prominence more effectively than (a). The common typological association of high pitch and prominence may be an indication of this. This explanation could be tested with further data for other *Accent 1* words with /iɔ/ vowel sequences. However it cannot be seriously considered without further data for the (b) pattern, as the association of high pitch with prominence for only high vowels is not a common linguistic phenomenon.

5.3 *Carabhan*: two alternative stress patterns

When *carabhan* /karavan/ 'caravan' is pronounced with initial stress, its tonal contours are in keeping with those of Accent 1 words. In 'final' context, L is indicated on the first syllable by a steep fall in F0. The fall continues, but less steeply, towards word-final L%. The three tones of the LH*L% 'question' pattern associate with one syllable each. For 'in focus' context, L associates with the initial stressed syllable, H* with the following unstressed syllable. These tones are shown with the F0 contours in Figure 5.5.

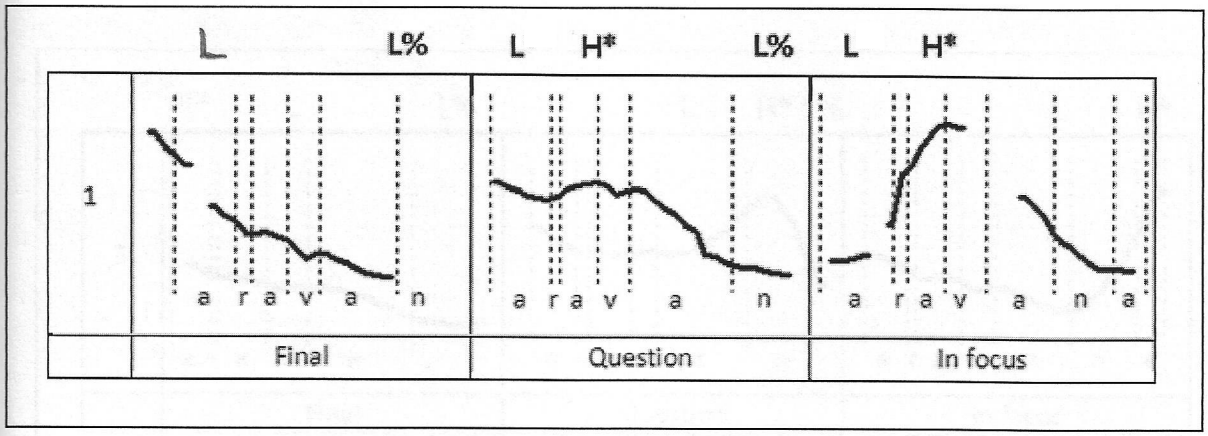

Figure 5.5

F0 contours of *carabhan* with initial stress as shown in Figure 4.2, now with tonal specifications.

In 'in focus' context, final-stressed *carabhan* follows the pattern predicted by the analysis given in section 5.1: L associates with the stressed syllable, and H* with the following unstressed syllable. However, the tonal contours for final-stressed *carabhan* do not match those predicted by the analysis in 'final' and 'question' contexts. In 'final' context, it is unclear how the rise in F0 on the stressed syllable should be interpreted, as the analysis predicts L. It may be that L associates early in the syllable, and the rise is due to the OCP, separating L and word-final L%. This interpretation is represented in Figure 5.6. L is coloured red, to indicate the uncertainty over its presence. *Carabhan* was pronounced with final stress in 'final' position by speakers 3 and 5 in both repetitions and by speaker 4 in one repetition. In all cases the tonal contour appeared to match that shown in Figure 5.6, but the pitch targets were never realised more clearly than in this example. In 'question' context, the whole LH*L% contour is realised on the final syllable. This shows that it is possible for three pitch targets to associate with one syllable. However, the analysis predicts that L% should be deleted due to the overcrowding constraint, as with final-stressed Accent 2 *ainm* which is reproduced in Figure 5.7.

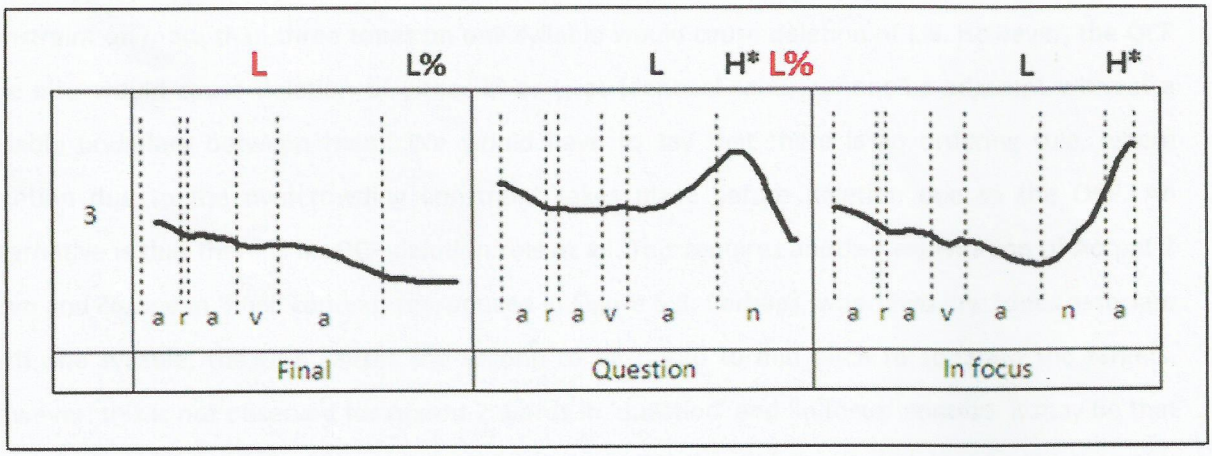

Figure 5.6

F0 contours of *carabhan* with final stress as shown in Figure 4.2, now with tonal specifications.

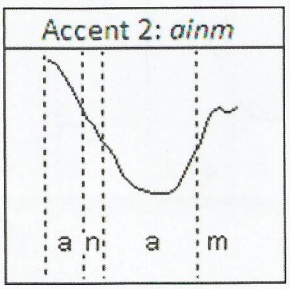

Figure 5.7

ainm in 'question' context

Only two examples of final-stressed *carabhan* were produced in 'question' context, both produced by speaker 3. While this puts a question mark over the analysis of section 5.1, it is not enough data to support an alternative analysis. The prosodic status of *carabhan* is not fully understood, so it would be particularly unwise to base an analysis on the behaviour of this one word. Further investigation into this problem would require data for words which consistently have a final stressed syllable with a short vowel. If the LH*L% pattern were to associate with this syllable in 'question' context, this would show for certain that the analysis of section 5.1 cannot apply to these words. An alternative analysis would have to account for the fact that final-stressed Accent 2 words cannot support L%. It is possible that in addition to the pitch-accent L, Accent 2 words have a lexical tone L^2.

There would then be four tones trying to associate with the final syllable of *ainm*: $L^2LH^*L\%$. A constraint on more than three tones on one syllable would cause deletion of L%. However, the OCP rule also would cause deletion of either L^2 or L, as identical tones cannot be adjacent without a syllable boundary between them. We would have to say that there is an ordering rule, where deletion due to the overcrowding constraint takes place before deletion due to the OCP. An alternative is that there is no OCP deletion rule at all. This requires another explanation of Accent 2 *ainm* and *carbad* in 'final' context, reproduced in Figure 5.8. Perhaps, when two low tones associate with one syllable, the OCP causes the second to be raised to mid pitch to separate the targets. However, this is not observed for Accent 2 words in 'question' and 'in focus' context. It may be that the following H* obscures this rise to mid pitch, or that the rise does not take place due to this inevitable obscuration.

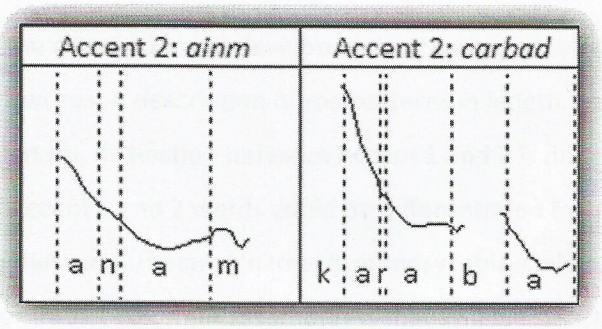

Figure 5.8

ainm and *carbad* in 'final' context

6 Conclusion

In this final section I consider to what extent this investigation has accomplished the research goals stated in section 1. I identify the contributions made to the study of ScG and also of language in general and highlight areas which require further investigation.

A primary goal was to provide a description of Accent 1 and 2 in various phrasal contexts. Only one tonal contour had been identified for each in previous studies, but Figure 4.0 shows that the tonal patterns of Accent 1 and 2 can change dramatically depending on the context. This is an indicator that future studies must indicate the phrasal context in which words are recorded so that tonal descriptions are comparable with other Gaelic dialects. The tonal patterns described contribute to a growing body of evidence from different languages that word-prosodic tone patterns must be examined in various contexts before they can be fully understood.

A further goal was to use the descriptions to develop understanding of syllable structure and stress patterns of Accent 1 and 2 words. A description of the patterns in length, vowel quality and amplitude made it clear that the distinction between Accent 1 and 2 is not entirely one of pitch. It revealed that the pairs of Accent 1 and 2 words could be differentiated by their stress pattern. It is then not necessary to say that *ainm* /²anam/ 'name' is monosyllabic. Unlike previous accounts, this interpretation does not contradict common assumptions that syllable structure is universally CV and that syllabification cannot be lexically contrastive. Clements' (1986) view that the svarabhakti vowel is derived by a synchronic phonological rule is not contradicted, but with my interpretation this rule is unnecessary.

The inclusion of data for different phrasal contexts led to consideration of tonal patterns within the autosegmental framework. The autosegmental analysis given for Accent 1 and 2 supports the evidence that the distinction is one of stress, as the tonal contours could be explained without a lexical tone. The analysis reveals the post-lexical tones which mark utterances as statements and indicate focus. These are comparable with the post-lexical prosody of other languages, and potentially other dialects of ScG.

However, the tonal contour of final-stressed *carabhan* in 'question' context is not predicted by the analysis. Further data for words which have a final stressed syllable with a short vowel is required before this contour can be considered in an analysis. Such an analysis may include a lexical tone, which would support Ternes' (2006) argument that ScG has a tonal contrast. According to Remijsen's (2001) definition, this would mean that the prosodic system of Ness Gaelic is a hybrid, consisting of

both lexical tone and lexical stress. Although this dissertation cannot certify the typological classification of Ness Gaelic's prosodic system, it has taken an initial step towards a fuller understanding of the prosodic distinction between Accent 1 and 2. In doing so, it points towards the next step, which will involve collection and analysis of further data.

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8 Appendices

8.1 Speaker profiles

Speaker	*Age*	*Gender*	*Years lived outside Ness*	*Years lived outside Lewis*	*Comments*
1	59	F	0	0	• Used a more formal style at work. • Seemed particularly aware of dialectal differences. • Occasionally introduced alternative intonation contours to convey attitudinal information.
2	43	F	15	0	
3	58	F	16	5	• Mother of the assistant. • Used a more formal style at work. • Married to a Gaelic speaker from Harris.
4	51	M	0	0	• Seemed to be particularly comfortable with the task.
5	65	F	40	40	
6	47	F	24	5	• Used a more formal style at work.
7	25	F	1	1	• Seemed a little uncomfortable with the task. • Reading appeared to strongly influence her speech. • She would usually use English with the assistant.
8	65	M	50	44	• Identified his dialect as particular to the village of Tàbost.

8.2 Map of Scotland

This map indicates locations of places referred to in the dissertation.

8.3 Dataset

Section 8.3.1 provids a list of the target words recorded. Sections 8.3.2 – 8.3.6 show the sentences in which the target words were embedded. The same frame sentences for the exchange between the assistant and the speaker were used for all nouns in each context. These frame sentences are given at the beginning of each section in their orthographic form, along with a broad transcription, gloss and English translation. The full sentences, with the target word inserted, are then listed. The sentences for verbs and adjectives are listed after the noun sentences.

8.3.1 Pairs of target words

	Accent 1			Accent 2		
/iɔ/	*fitheach*	/ˈfiɔx/	'raven'	*fiach*	/ˈfiɔx/	'debt'
/uə/	*rudhadh*	/ˈruəɣ/	'blushing'	*ruadh*	/ˈruəɣ/	'ginger'
/a:/	*adha*	/ˈa:/	'liver'	*àth*	/ˈa:/	'ford'
/i:/, /əi/	*tighinn*	/ˈtʲi:nʲ/	'coming'	*tinn*	/ˈtʲəinʲ/	'ill'
	anam	/ˈanam/	'soul'	*ainm*	/ˈanam/	'name'
	carabhan	/ˈkaravan/	'caravan'	*carbad*	/ˈkarabad/	'carriage'

8.3.2 'Final' context

The target word is in final position, and is the only new information.

Nouns:

Cò	*air*	*a*	*tha*	*thu*	*smaoineachadh?*	*Tha*	*mi*	*smaoineachadh*	*air*	[target]
/ko/	/er/	/a/	/ha/	/u/	/ˈsmɤ:nʲəxəɣ/	/ha/	/mi/	/ˈsmɤ:nʲəxəɣ/	/er/	
Who	on	CONJ	are	you	thinking	am	I	thinking	on	
'What are you thinking about?'						'I am thinking about (a/the) [target]'				

Tha mi smaoineachadh air fitheach.	'I am thinking about a raven.'
Tha mi smaoineachadh air an fhitheach.	'I am thinking about the raven.'
Tha mi smaoineachadh air fiach.	'I am thinking about a debt.'
Tha mi smaoineachadh air an fhiach.	'I am thinking about the debt.'
Tha mi smaoineachadh air rudhadh.	'I am thinking about blushing.'
Tha mi smaoineachadh air adha.	'I am thinking about a liver.'
Tha mi smaoineachadh air àth.	'I am thinking about a ford.'
Tha mi smaoineachadh air anam.	'I am thinking about a soul.'
Tha mi smaoineachadh air ainm.	'I am thinking about a name.'
Tha mi smaoineachadh air carabhan.	'I am thinking about a caravan.'
Tha mi smaoineachadh air carbad.	'I am thinking about a carriage.'

Verbs, adjectives:

Dè tha thu a' dol a dhèanamh? 'What are you going to do?''	*Tha mi smaoineachadh air tighinn.* 'I am thinking about coming.'
Dè tha ceàrr air Calum? 'What is wrong with Calum?'	*Tha mi smaoineachadh gu bheil e tinn.* 'I think he is ill.'
Dè an dath a th' air falt Mhàiri? 'What is Mairi's hair-colour?'	*Tha mi smaoineachadh gu bheil i ruadh.* 'I think she is ginger.'
Dè an dath a th' air falt Mhàiri? 'What is Mairi's hair-colour?'	*Tha mi smaoineachadh gu bheil e ruadh.* 'I think it is ginger.'

8.3.3 Question

The target word is in final position. The sentence constitutes a yes-no question. For this context, the speaker speaks before the assistant, not after.

Nouns:

Bheil	*thu*	*smaoineachadh*	*air*	[target]*?*
/vɛlʲ/	/u/	/²smɤːnʲəxəɣ/	/er/	
are.DEP	you	thinking	on	

'Are you thinking about (a) [target]?'

Chan	*eil,*	*chan*	*eil*	*mi*	*smaoineachadh*	*air*	[target]
/xanʲ/	/ɛl/	/xanʲ/	/ɛl/	/mi/	/²smɤːnʲəxəɣ/	/er/	
NEG	is.DEP	NEG	is.DEP	I	thinking	on	

'No, I am not thinking about (a) [target].'

Bheil thu smaoineachadh air fitheach?
'Are you thinking about a raven?'

Chan eil, chan eil mi smaoineachadh air fitheach.
'No, I'm not thinking about a raven.'

Bheil thu smaoineachadh air an fhitheach?
'Are you thinking about a raven?'

Chan eil, chan eil mi smaoineachadh air an fhitheach.
'No, I'm not thinking about a raven.'

Bheil thu smaoineachadh air fiach?
'Are you thinking about a debt?'

Chan eil, chan eil mi smaoineachadh air fiach.
'No, I'm not thinking about a debt.'

Bheil thu smaoineachadh air an fhiach?
'Are you thinking about a debt?'

Chan eil, chan eil mi smaoineachadh air an fhiach.
'No, I'm not thinking about a debt.'

Bheil thu smaoineachadh air rudhadh?
'Are you thinking about blushing?'

Chan eil, chan eil mi smaoineachadh air rudhadh.
'No, I'm not thinking about blushing.'

Bheil thu smaoineachadh air adha?
'Are you thinking about a liver?'

Chan eil, chan eil mi smaoineachadh air adha.
'No, I'm not thinking about a liver'

Bheil thu smaoineachadh air àth?
'Are you thinking about a ford?'

Chan eil, chan eil mi smaoineachadh air àth.
'No, I'm not thinking about a ford.'

Bheil thu smaoineachadh air anam?
'Are you thinking about a soul?'

Chan eil, chan eil mi smaoineachadh air anam.
'No, I'm not thinking about a soul'

Bheil thu smaoineachadh air ainm?
'Are you thinking about a name?'

Chan eil, chan eil mi smaoineachadh air ainm.
'No, I'm not thinking about a name.'

Bheil thu smaoineachadh air carabhan?
'Are you thinking about a caravan?'

Chan eil, chan eil mi smaoineachadh air carabhan.
'No, I'm not thinking about a caravan.'

Bheil thu smaoineachadh air carbad?
'Are you thinking about a carriage?'

Chan eil, chan eil mi smaoineachadh air carbad.
'No, I'm not thinking about a carriage.'

Verbs, adjectives:

Bheil thu smaoineachadh air tighinn?
'Are you thinking of coming?'

Chan eil, chan eil mi smaoineachadh air tighinn.
'No, I'm not thinking of coming.'

Bheil thu smaoineachadh gu bheil e tinn?
'Do you think he is ill?'

Chan eil, chan eil mi smaoineachadh gu bheil e tinn.
'No, I don't think he is ill.'

Bheil thu smaoineachadh gu bheil e ruadh?
'Do you think he is ginger?'

Chan eil, chan eil mi smaoineachadh gu bheil e ruadh.
'No, I don't think he is ginger.'

8.3.4 Out of focus

The target word is in medial position. The word in final position receives narrow focus.

Nouns:

Bheil	*am*	[target]	*aigesan?*
/vɛl'/	/am/		/ˈag'əsən/
is.DEP	the		at.3SG.EMPH

'Does he have the [target]?'

Chan	*eil,*	*tha*	*am*	[target]	*aig*	*Màiri.*
/xan'/	/ɛl'/	/ha/	/am/		/ag'/	/²ma:r'i/
NEG	is.DEP	is	the		at	Mairi

'No, Mairi has the [target].'

Chan eil, tha am fitheach aig Màiri.	'No, the raven belongs to Màiri.'
Chan eil, tha am fiach aig Màiri.	'No, the debt is Màiri's.'
Chan eil, tha an t-adha aig Màiri.	'No, the liver belongs to Màiri.'
Chan eil, tha an t-àth aig Màiri.	'No, the ford belongs to Màiri.'
Chan eil, tha an t-anam aig Màiri.	'No, the soul belongs to Màiri.'
Chan eil, tha an t-ainm aig Màiri.	'No, the name belongs to Màiri.'
Chan eil, tha an carabhan aig Màiri.	'No, the caravan belongs to Màiri.'
Chan eil, tha an carbad aig Màiri.	'No, the carriage belongs to Màiri.'

Verbs, adjectives:

An robh thu rudhadh as a' mhadainn an-diugh?	*Cha robh, ach bha mi rudhadh an-dè.*
'Were you blushing this morning?'	'No, but I was blushing yesterday.'
Bheil thu tighinn an-diugh?	*Chan eil, ach tha mi tighinn a-màireach.*
'Are you coming today?'	'No, but I'm coming tomorrow.'
Bheil thu tinn an-diugh?	*Chan eil, bha mi tinn an-dè.*
'Are you ill today?'	'No, I was ill yesterday.'
Bheil a falt ruadh am bliadhna seo?	*Chan eil, ach bha e ruadh an-uiridh.*
'Is her hair ginger this year?'	'No, but it was ginger last year.'

Bheil a falt ruadh am bliadhna seo? — *Chan eil, ach bha i ruadh an-uiridh.*
'Is her hair ginger this year?' — 'No, but she was ginger last year.'

8.3.5 Medial

The target word is in medial position, and is the only new information.

Nouns:

Cò	*air*	*a*	*tha*	*thu*	*smaoineachadh?*
/ko/	/er/	/a/	/ha/	/u/	/²smɤ:nˈəxəɣ/
Who	on	CONJ	are	you	thinking

'What are you thinking about?'

Tha	*mi*	*smaoineachadh*	*air*	[target word]	*a-rithist.*
/ha/	/mi/	/²smɤ:nˈəxəɣ/	/er/		/a¹ri:ʃt/
am	I	thinking	on		again

'I am thinking about (a) [target word] again.'

Tha mi smaoineachadh air fitheach a-rithist.
'I am thinking about a raven again.'

Tha mi smaoineachadh air an fhitheach a-rithist.
'I am thinking about a raven again.'

Tha mi smaoineachadh air fiach a-rithist.
'I am thinking about debt again.'

Tha mi smaoineachadh air an fhiach a-rithist.
'I am thinking about the debt again.'

Tha mi smaoineachadh air rudhadh a-rithist.
'I am thinking about blushing again.'

Tha mi smaoineachadh air adha a-rithist.
'I am thinking about a liver again.'

Tha mi smaoineachadh air àth a-rithist.
'I am thinking about a ford again.'

Tha mi smaoineachadh air anam a-rithist.
'I am thinking about a soul again.'

Tha mi smaoineachadh air ainm a-rithist.
'I am thinking about a name again.'

Tha mi smaoineachadh air carabhan a-rithist.
'I am thinking about a caravan again.'

Tha mi smaoineachadh air carbad a-rithist.
'I am thinking about a carriage again.'

Verbs, adjectives:

Dè tha thu a' dol a dhèanamh an-diugh?
'What are you going to do today?'

Tha mi smaoineachadh air tighinn a-rithist.
'I am thinking about coming again.'

Dè tha ceàrr air Domhnall?
'What is wrong with Donald?'

Tha mi smaoineachadh gu bheil e tinn a-rithist.
'I think he is ill again.'

Dè an dath a tha air a falt an t-seachdain sa?
'What colour is her hair this week?'

Tha mi smaoineachadh gu bheil e ruadh a-rithist.
'I think it is ginger again.'

Dè an dath a tha air a falt an t-seachdain sa?
'What colour is her hair this week?'

Tha mi smaoineachadh gu bheil i ruadh a-rithist.
'I think she is ginger again.'

8.3.6 In focus

The target word is in medial position, and receives narrow focus.

Nouns:

Bheil	[noun]	*aig*	*Màiri?*	*Chan*	*eil,*	*tha*	[target]	*aig*	*Màiri.*
/vɛl'/		/ag'/	/²ma:r'i/	/xan'/	/ɛl'/	/ha/		/ag'/	/²ma:r'i/
is.DEP		at	Mairi	NEG	is.DEP	is		at	Mairi
'Does Mairi have a [noun]?'				'No, Mairi has a [target].'					

Bheil uiseag aig Màiri?
'Does Mairi have a lark?'

Chan eil, tha fitheach aig Màiri.
'No, Mairi has a raven.'

Bheil airgead aig Màiri?
'Does Mairi have money?'

Chan eil, tha fiach aig Màiri.
'No, Mairi has debt.'

Bheil an staoig aig Màiri?
'Does Mairi have the steak?'

Chan eil, tha an t-adha aig Màiri.
'No, Mairi has a liver.'

Bheil an drochaid aig Màiri?
'Does Mairi have the bridge?'

Chan eil, tha an t-àth aig Màiri.
'No, Mairi has the ford.'

Bheil an corp aig Màiri?
'Does Mairi have the body?'

Chan eil, tha an t-anam aig Màiri.
'No, Mairi has the soul.'

Bheil aois an t-euslainteach aig Màiri?
'Does Mairi have the patient's age?'

Chan eil, tha an t-ainm aig Màiri.
'No, Mairi has the name.'

Bheil bhana aig Màiri?
'Does Mairi have a van?'

Chan eil, tha carabhan aig Màiri.
'No, Mairi has a caravan.'

Bheil baidhsagal aig Màiri?
'Does Mairi have a bike?'

Chan eil, tha carbad aig Màiri.
'No, Mairi has a carriage.'

Verbs, adjectives:

An robh thu air do nàrachadh an-dè?
'Were you embarrassed yesterday?'

Cha robh, ach bha mi rudhadh an-dè.
'No, but I was blushing yesterday.'

Bheil thu fuireachd aig an taigh an-diugh?
'Are you staying home today?'

Chan eil, tha mi tighinn an-diugh.
'No, I'm coming today.'

Bheil thu faireachdainn beothail an-diugh?
'Are you feeling lively today?'

Chan eil, tha mi tinn an-diugh.
'No, I'm ill today.'

Bheil a falt purpaidh an-diugh?
'Is her hair purple today?'

Chan eil, tha e ruadh an-diugh.
'No, it's ginger today.'

Bheil a falt purpaidh an-diugh?
'Is her hair purple today?'

Chan eil, tha i ruadh an-diugh.
'No, she's ginger today.'